

CLAIMS

1. (original) A silicon-based semiconductor microcircuit radiation hardening method comprised of:

heating the microcircuit in a vacuum furnace to remove any hydrogen in the microcircuit structure; and
annealing the microcircuit with deuterium containing forming gas.

2. (original) The radiation hardening method of claim 1, wherein the microcircuit is heated in a vacuum for approximately 1 hour at between 400 and 700° C.

3. (original) The radiation hardening method of claim 2, wherein the microcircuit is heated in a vacuum of 10^{-6} torr or less.

4. (original) The radiation hardening method of claim 3, wherein the microcircuit is annealed in deuterium-containing forming gas for about 30 minutes at about 400° C.

5. (original) The radiation hardening method of claim 3, wherein the microcircuit includes MOSFET devices.

6. (original) The radiation hardening method of claim 3, wherein the microcircuit includes EEPROM devices.

7. (original) A radiation hardened silicon-based semiconductor microcircuit prepared by a process comprising the steps of:

fabricating the microcircuit using standard techniques of silicon-based microelectronics up to the step of passivation using a forming gas anneal;

heating the microcircuit in a vacuum furnace to remove any hydrogen in the microcircuit structure; and

annealing the microcircuit with deuterium containing forming gas.

8. (original) The radiation hardened semiconductor microcircuit of claim 7, wherein during the heating step, the microcircuit is heated in a vacuum for approximately 1 hour at about 500° C.

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9. (original) The radiation hardened semiconductor microcircuit of claim 8, wherein during the heating step, the microcircuit is heated in a vacuum of 10^{-6} torr or less.

10. (original) The radiation hardened semiconductor microcircuit of claim 9, wherein the microcircuit is annealed in deuterium-containing forming gas for about 30 minutes at about 400° C.

11. (previously amended) A radiation hardened silicon-based semiconductor microcircuit prepared by a process comprising the steps of:

fabricating the microcircuit using standard techniques of silicon-based microelectronics up to the step of heating the microcircuit;

heating the microcircuit in a vacuum; and

annealing the microcircuit with deuterium-containing forming gas.

12. (currently amended) A radiation hardened silicon-based semiconductor microcircuit prepared by a process comprised of :

fabricating the microcircuit using standard techniques of silicon-based microelectronics except that deuterium is substituted for hydrogen in any fabrication step that involves hydrogen gas or hydrogen-containing species, and.

heating the microcircuit in a vacuum.

13. (canceled)
